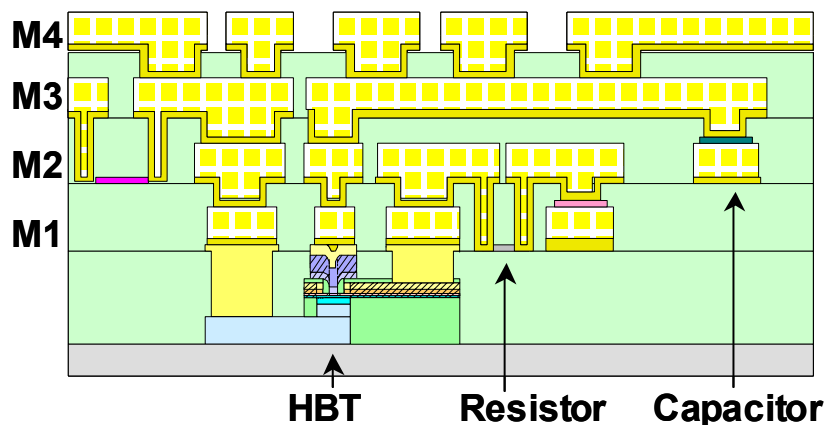


Schematic of Northrop Grumman Space Technology's TFAST planar HBT process:



Develop highly scaled super-fast InP HBT technology combining

- Advanced scaling, regrowth, and planarization from silicon-based processes
- III-V material and process advantages
- Multi-layer frontside interconnect
- Advanced backside process with thinner substrates.

Demonstrate TFAST technology capability with digital and mixed signal circuits

### Major Technical Accomplishments

(since start of contract)

- Demonstrated successful HBTs with MBE regrowth
- Demonstrated conductive n- and p-type polycrystalline III-V materials
- Demonstrated many key process elements of new low-K interconnect process

### Major Work Remaining to Completion of Contract

- Demonstrate regrown *submicron* HBTs
- Develop dielectric planarization process
- Assemble all developed process steps into one unified technology

### Major Impact of Technology & Technology Transition Plan

- Combined 100x to 1000x improvement in speed/power/size/weight over present InP HBT technology
- Enables revolutionary high-leverage electronics for future U.S. military, space, and national asset applications
- Reduce size/weight/power dissipation by 500x for tunable SHF modulator exciter (TSME) slice for Advanced EHF